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PIASKOVSKAIA-[illegible]KVA, Y[illegible]V.

1 Jan 53

USSR/Geophysics-Light Scattering

"Some Properties of Atmospheric Indicatrices of Light Scattering," Ye.V. Pyaskovskaya-Fesenkiva, Astrophys Inst, Acad Sci Kazakh SSR

Dan-SSSR, Vol 88, No 1, pp 53-56

Describesexptl results from observations of light scattering and presents rwd relating scattering angles and indicatrices. Received 4 Nov 52

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PYASKOVSKAYA-FESENKOVA, Ye.V.

Some facts on light scattering in the atmosphere. Izv. Astrofiz.Inst. AN Kazakh.SSR 1 no.1/2:188-202 '55. (MLRA 9:10)

(Atmospheric transparency) (Light--Scattering)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

PYASKOVSKAYA-FESENKOVA, Ye.V.

Relation between the light scattering coefficient for various angles and the optical thickness of the atmosphere. Izv. Astrofiz.Inst. AN Kazakh.SSR 1 no.1/2:203-213 '55.

(MLRA 9:10)

(Atmospheric transparency) (Light--Scattering)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

PYASKOVSKAYA-FESENKOVA, Ye.V.

Determining the coefficient of atmospheric transparency from sky brightness. Astron. zhur. 32 no.6:527-544 N-D '55. (MLRA 9:2)

1. Astrofizicheskiy institut Akademii nauk Kazakhskoy SSR. (Atmospheric transparency)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3"

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PYASKOVSKAYA, YE. V.

USSR/ Geophysics - Light dispersion

Card 1/1 Pub. 22 - 22/62

Authors : Pyaskovskaya - Fesenkova, Ye. V.

Title : Calculation of light dispersion of the higher orders

Periodical : Dok. AN SSSR 102/3, 503 - 508, May 21, 1955

Abstract : A proof is presented that the light dispersion of the higher orders can be computed from the data obtained in plain direct observations. Four USSR references (1943-1955). Diagrams.

Institution : The Acad. of Sc., USSR, Astrophysical Institute Alma-Ata, KazSSR

Presented by: Academician V. G. Fesenkov, February 15, 1955

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

PYASKOVSKAYA-FESENKOVA, Ye.V.

Brightness of the sky considering all forms of light scattering.
Dokl.AN SSSR 103 no.6:1013-1015 Ag '55. (MLRA 9:1)

1.Predstavleno akademikom V.G.Fesenkovym.
(Sky, Color of)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

PYASKOVSKAYA-FESENKOVA, Ye.V.

Various methods for determining the atmospheric transparency coefficient. Izv.Astrofiz.Inst. AN Kazakh. SSR 3 no.4:73-82 '56. (MLRA 9:10)

(Atmospheric transparency)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

PYASKOVSKAYA-FESENKOVA, Ye.V.

Calculation of light scattering of higher orders. Izv.Astrofiz. Inst. AN Kazakh. SSR 3 no.4:99-100 '56. (MLRA 9:10)

(Light--Scattering)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

Name: PYASKOVSKAYA-FESENKOVA, Yevgeniya Vladimirovna

Dissertation: Study of the dispersion of light in the earth' atmosphere

Degree: Doc Phys-Math Sci

Affiliation: Astrophysical Inst of Acad Sci Kazakh SSR

Defense Date, Place: 22 Mar 57, Joint Council of Inst of Physics of the Earth, Inst of Physics of the Atmosphere, and Inst of Applied Geophysics, Acad Sci USSR

Certification Date: 21 Sep 57

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PHASE I BOOK EXPLOITATION

Pyaskovskaya-Fesenkova, Ye. V.

Issledovaniye rasseyaniya sveta v zemnoy atmosfere (Investigation of Light Scattering in the Earth's Atmosphere) Moscow, Izd-vo AN SSSR, 1957. 217 p. 2,500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR.

Resp. Ed.: Fesenkov, V. G.; Ed. of Publishing House: Yefremov, Yu. I.; Tech. Ed.: Kiseleva, A. A.

PURPOSE: The book presents advances made in the study of light scattering in terrestrial atmosphere and is directed to the specialist in the field.

COVERAGE: This book is a theoretical study of the optics of terrestrial atmosphere and is supplemented with observations of the brightness of the daylight sky conditioned by molecular and aerosol scattering of light. A new method is proposed for the derivation of the scattering indicatrix from the calculation of multiple light scattering in the atmosphere.

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V. G. Fesenkov's criterion of stability of the optical properties of atmosphere is refined and expanded. The author discusses his proposed methods for determining the atmospheric transparency coefficient and the brightness of the daylight sky. Observations of sky brightness were performed by: N. N. Kalitin, G. A. Tikhov, V. G. Fesenkov (Astrophysical Observatory at Kuchino "Astrofizicheskaya observatoriya v Kuchino pod Moskvoy"); V. A. Krat (Tashkent); V. V. Sobolev and Ye. N. Yustova (Yelabuga); V. N. Yaroslavtsev (Tashkent); G. Sh. Livshits (Alma-Ata); Ye. V. Pyaskovskaya-Fesenkova; L. V. Fesenkova; A. P. Kutyreva; T. P. Toropova; V. M. Kazachevskiy; P. N. Boyko; and N. I. Ovchinnikova. The author made visual-photometry observations at different places varying in elevation (h): Gudauta, Caucasian shore of the Black Sea (h = 3m.); a state farm near Pugachevsk (h = 100m.); Orlinaya gora at Vladivostok (h = 144m.); sanatorium "Yzkoye" near Moscow (h ≈ 150m.); village of Bogorodsoye near Ivanovo (h ≈ 150m.); Sary-Ishik-Ortau Desert, Southern Pribalkhash (h = 400m.); Sikhote-Alin' (h ≈ 600m.); Alma-Ata Observatory (h = 1450m.); shore of Issyk-Kul' Lake (h = 1600m.); Kislovodsk Astronomical Station of the GAO AN SSSR (h = 2130m.), and Kumbel' Mountain near Alma-Ata (h = 3140m.). Other personalities mentioned: G. Sh. Lifshits, K. N. Shistovskiy, Kh. A. Abishev, M. P. Pervertyn, V. B. Nikonov, V. G. Kastrov, Ye. S. Kuznetsov, and V. V. Ovchinskiy. There are 106 figures, 65 tables, and 104 references, 77 of which are Soviet, 9 USA, 2 British, and 1 Polish.

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Investigation of Light Scattering in the Earth's Atmosphere 307

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

PYASKOVSKAYA-FESENKOVA, Ye.V.

49-12-15/16

AUTHOR: Kirillov, F.A.

TITLE: Dissertations Defended in the Scientific Council of the Institute of Physics of the Earth, Institute of Physics of the Atmosphere and Institute of Applied Geophysics, Ac.Sc.USSR during the First Semester of 1957 (Dissertatsii, zashchishchennye v uchenom sovete instituta fiziki zemli, instituta fiziki atmosfery i instituta prikladnoy geofiziki AN SSSR za pervoye polugodiye 1957)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, 1957, No.12, pp. 1532 - 1536 (USSR).

ABSTRACT: Ye.S. Borisevich - Magneto-electric Oscillographs for Experimental Geophysical Investigations (Magnitoelektricheskiye ostsillografy dlya eksperimental'nykh geofizicheskikh issledovaniy) - Doctor dissertation. Opponents: Corresponding Member of the Ac.Sc. USSR, M.A. Sadovskiy, Doctor of Physico-Mathematical Sciences, D.P. Kirnos, Doctor of Technical Sciences, G.L. Shnirman. May 10, 1957. In the dissertation, the design was briefly reviewed of 16 various models of oscillographs for experimental, geophysical investigations which were developed by the author or under his direction. Some of these are series-manufactures and apply also in other branches of science and engineering. Particular attention is devoted to the design of the individual assemblies of the oscillographs. Standard assemblies include type ГБ galvanometers, mounted into blocks with permanent magnets, galvanometer illumination, time markers,

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compact gear boxes with swivel-mounted sectors, spring-powered engines, speed regulators. All the oscillographs developed by the Institute of Physics of the Earth, which is pioneering in this field in the Soviet Union, can be sub-divided into the following three groups: oscillographs for recording short-duration processes with high speeds of the film; oscillographs for recording long-duration of occasional processes at relatively low speeds of the film strip; universal oscillographs for recording various processes within a wide range of speeds of the film strip. Oscillographs intended for recording long-duration and occasional phenomena (earthquakes) and designed for recording with a speed of 0.1 to 2 cm/sec for moving the film; spring-operated mechanisms proved advantageous in this case and therefore it was necessary to develop special speed-regulators. The presence of spring-operated mechanisms and galvanometers grouped into a block with a common permanent magnet enabled reducing parasitic influences on the metering circuit and also reducing to a

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minimum the power consumption of the oscillograph, which is particularly important in regions with difficult access. Universal, portable oscillographs represent the widest group amongst oscillographs produced in the Institute; they are small and light and therefore convenient for expeditions; they are suitable not only for recording geophysical, but any other phenomena which can be transformed into an electric current or voltage. The oscillographs ПОБ-14 M, ПОБ-12 M and ПОБ-9 are among the best produced in the Soviet Union as well as in other countries. The developed, fundamental, typical assemblies and unification of the main circuits enabled rationalising the design of the oscillographs and also simplifying and covering the cost of the development and manufacture of new models adapted for given conditions. First, the author considers the method of calculation of the basic elements of the oscillographs which he has developed; all the calculations were tested by practical experience and are effected by formulae which are convenient for practical use. For simplifying the calculations, nomograms,

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data tables and examples are included. A fundamentally-new metering system was created; a high-frequency, frame galvanometer with a "continuous extension (pull)" and a method of calculation is presented for this type of galvanometer, giving results of experimental investigations which indicate the possibility of achieving a sensitivity exceeding that of loops. The conditions of optimum electro-magnetic and liquid damping of frame galvanometers were investigated. The calculation is presented of the kinematics of oscillographs and of film adaptors and the phenomenon of shock was considered when switching on film adaptors designed for high speeds. Formulae are derived which permit calculation of the impact force and of the time necessary for reaching a given speed. A new type of simple, compact and reliable gear box was developed and the method of its calculation evolved. Other mechanisms were also considered, intended for stepped and stepless speed changes and used for oscillographs. A method of calculation is proposed of spring-

Card4/21operated mechanisms for oscillographs aiming at achieving maximum

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useful work from the energy stored in the springs. The problem is considered of ensuring uniform movement of the film strip and various designs were developed of speed regulators with low-rated r.p.m. which are capable of taking up a considerable excess moment generated by the springs. A method of calculation is presented of a radial-action, centrifugal regulator. All the described oscillographs were used in geophysical investigations, i.e. in studying the physics of earthquakes by systematic recording of weak, local tremors, development of a new method of deep seismic-sounding of the Earth's crust, study of the vibrations of soils and of buildings caused by explosions and earthquakes, development of new, progressive methods of seismic and electro-magnetic prospecting of minerals study of atmospheric phenomena, etc. The oscillographs developed by the author are widely used, not only for geophysical investigations, but also in scientific establishments and undertakings of various ministries and the manufacture of these instruments does not satisfy requirements.

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Ye.V. Pyaskovskaya-Fesenkova - Investigation of the Scattering of Light in the Earth's Atmosphere (Issledovaniye rasseyaniya sveta v zemnoy atmosfere) - Doctor dissertation. Opponents: Doctor of Physico-Mathematical Sciences Ye.S. Kuznetsov, Doctor of Physico-Mathematical Sciences S.M. Polozkov, Doctor of Physico-Mathematical Sciences G.B. Rozenberg, Doctor of Physico-Mathematical Sciences I.S. Shklovskiy. March 23, 1957. The dissertation represents the result of many years of study of the clear, daytime sky. The observations were carried out in twelve locations at various altitudes above the sea, various climatic, meteorological and synoptic conditions. The observations were carried out mainly during high-transparency of the atmosphere in the visual range of the spectrum in the absence of a snow cover. In the investigations two instruments, designed by V.G. Fesenkov were used; one of these was a visual photometer of the daytime sky intended for measuring the brightness of the firmament; the other was a photo-

Card6/21 electric halo photometer for determining the brightness from

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near-sun halo and also from the sun on a surface perpendicular to these rays. The dissertation contains a certain formula of the brightness of the sky, taking into consideration only the brightness of the first order and derived on the assumption of a "flat" Earth and giving some conclusions derived on the basis of this formula. For a certain coefficient of transparency of the atmosphere, the brightness of the sky at any point is represented by derivation of two functions of which one is the function of the diffusion of light and the other is a function of the zenith distances of the sun and of the observed point of the sky. On changing of the zenith distances of the sun z from 90 to 0°, the brightness of the sky on the almucantar of the sun increases first, reaching a maximum for a certain value of z, and then decreases. A method is also proposed of determining the brightness of the clear daylight sky at any point based on measuring the brightness along the almucantar of the sun and of 5-6 points of the firmament located at various zenith distances. This method permits determination

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of the brightness at any other point from the observed brightness of the sky. The method consists essentially of excluding from the observed brightnesses local indicatrices of the diffusion and introducing another one which relates to the spot where it is desired to determine the brightness of the sky; for this purpose, it is necessary tc measure at that point the brightness of the sky along the almucantar of the sun. A necessary condition thereby is that the transparency coefficients of the atmosphere be equal in both points. The theoretical brightness was also considered, taking into consideration the multiple scattering of light in the case of a spherical indicatrix of scattering and a comparison is made of this brightness with the one observed at an angular distance of the sun of 57 - 60°. For solving the integral equation of the theory of the diffusion of light, the approximate method of Ye.S. Kuznetsov was used which proved sufficiently accurate. Diffusion indicatrices are given in the dissertation which were obtained from observations of the brightness of the sky

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calculated for the entire height of the atmosphere. It is shown that there is no well-defined relation between the coeff-icient of scattering μ for small scattering angles ϑ and the coefficient of transparency or, respectively, the optical thickness of the atmosphere. Such a well-defined dependence does exist for diffusion angles approaching 60°. Thus, the diffusion of light near $\vartheta = 60^\circ$ does not depend on the prop-erties of the diffusion particles. It is shown that the diffusion of light in the Earth's atmosphere cannot be attrib-uted to a medium particle with some definite effective radius. The effective radius of the diffusion particle changes with the diffusion angle. The dependence of the diffusion of light in the Earth's atmosphere on the wavelength for the visual part of the spectrum can be expressed by the relation $\mu = c\lambda^{-n}$, representing a generalisation of the known Rayleigh formula where $n > 0$ and independent of the wavelength for all angular distances of the sun, provided the dust content of the atmosphere is not high. If that is not the case, this relation is dis-turbed and becomes somewhat complicated for small angular

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distances to the sun (the halo surrounding the sun); the number n is dependent on the wavelength and in some parts of the spectrum may become negative. This explains the various colour shadings of the halo surrounding the sun. A method is proposed of determining the indicatrix of the atmosphere which is not affected by the influence of the multiple diffusion of light. This method permits obtaining the indicatrix solely from the observed data and consists in determining by two differing methods the optical thickness of the atmosphere. One method gives optical thickness τ_1 on the basis of measurement of the direct solar radiation and is therefore not dependent on the multiple diffusion of light. In the other method, the optical thickness is determined by measuring the brightness of the sky and, consequently, is influenced by the multiple diffusion. The difference between these gives an increase in the optical thickness of the atmosphere which depends on the multiple diffusion of light, i.e. of the diffusion in all directions of the light flux caused by diffusion of higher orders relative

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to the incident light flux. The author gives the formula of the brightness of the sky, taking into consideration the multiple diffusion and also the light reflected from the underlying surface. The problem of stability of optical properties of the atmosphere was considered and existing stability criteria were supplemented and improved by the author. It is shown, too, that the ratio of the brightness of the sky at any point of the almucantar of the sun to the illumination from the sun also gives a linear dependence on the atmosphere mass and consequently can serve as a criterion of stability of the optical properties of the atmosphere. Finally, methods are described of determination of coefficients of transparency of the atmosphere from the brightness of a clear sky, namely: a method based on the instant of maximum brightness of the halo surrounding the sun; a method based on the indicatrix of diffusion of light in the atmosphere; a method of determining the coefficient of transparency on the basis of empirical formulae.

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Dissertations Defended in the Scientific Council of the Institute of Physics of the Earth, Institute of Physics of the Atmosphere and Institute of Applied Geophysics, Ac. Sc. USSR during the First Semester of 1957.

V.A. Romanyuk - Determination of the Gravity Forces on the Sea by the Pendulum Method (Opredeleniye tyazhesti na more mayatnikovym sposobom) - Candidate dissertation. Opponents: Doctor of Physico-Mathematical Sciences I.D. Zhongolovich, Doctor of Physico-Mathematical Sciences V.V. Fedynskiy, Candidate of Physico-Mathematical Sciences N.N. Pariyskiy. May 31, 1957. The author attempted to make a more exact analysis of the movement of a pendulum on a mobile support with the aim of deriving more accurate formulae and developing methods for the calculation of the action of acceleration and inclination of the base of the pendulum. The calculation of this action is precisely the most important and least clear problem in the theory of the measurement of gravity forces on sea.
The author obtained a formula for the correction of the inclination and acceleration of the support in the observed value of gravity force which is valid for accelerations below 50 gl.
The main terms of this relation correspond to the corrections of Brown, but there is some divergence in the terms

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which depend on the periods of oscillations of the pendulum and the accelerations. In many cases, these terms can be disregarded. The problem was formulated and solved of determining the accelerations and the inclinations of the mounting by means of inclination-meters and accelero-meters. Attention is drawn to the erroneous nature of the view relating to the compensation of the term $\ddot{z}_0$ during the observation time ($\ddot{z}_0$ - vertical acceleration component of the mounting in an absolute system of co-ordinates). Under certain unfavourable conditions, particularly during observations in submarines, $\ddot{z}_0$ can be considerably larger than the value of other correction factors of the second order. For reducing the influence of the term $\ddot{z}_0$, the author proposed to increase the number of measurements at various sections of the film during determination of the average period of the pendulum; for this purpose, it is necessary to carry out recordings at the beginning and at the end of observations at high-speed of movement of the film for durations

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of 4 - 6 minutes. The advantage was emphasised of constructing pendulum instruments in a cardan suspension with a minimum natural frequency. It is not advisable to apply a damping device of the cardan suspension, which is linked with the ship. Methods were developed and investigated of evaluating the recordings of inclination-meters and accelero-meters for obtaining correction for the inclination and the acceleration and appropriate calculations were made based on materials collected by marine gravimetric expeditions. It is concluded that it is in principle possible to effect pendulum measurements on surface ships provided that the acceleration of the ship is below 20 gl; at larger accelerations, considerable difficulties occur associated with the determination of the accelerations and inclinations.

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I.I. Rokityanskiy - Induced Polarisation in Ion-conducting Rocks (Vyzvannaya polyarizatsiya ionoprovodyashchikh porod) - Candidate dissertation. Opponents: Doctor of Geol.-Min. Sciences V.N. Dakhov, Doctor of Phys.-Math. Sciences A.G. Tarkhov, Candidate of Phys.-Math. Sciences D.A. Fridrikhsberg. May 17, 1957.

The author investigated under induced polarisation the physico-chemical phenomena taking place in rocks and other non-uniformly conducting bodies under the effect of an electric current. These phenomena lead to the generation of secondary e.m.f. which exist for some time, even after the primary current is switched off. Study of the nature of the induced polarisation of ion-conducting rocks is of great importance in elucidating the prospecting possibilities of this method, both in field prospecting, particularly coring, and also for studying the properties of transient regions between the liquid (water) and the solid dielectric, i.e. in elucidating one of the difficult problems of the physics of surfaces. The author has studied the influence on induced

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Dissertations Defended in the Scientific Council of the Institute of Physics of the Earth, Institute of Physics of the Atmosphere and Institute of Applied Geophysics, Ac.Sc. USSR during the First Semester of 1957.

polarisation of a number of factors: the chemical composition of the pore moisture, the ζ-potential, the structure of the specimen and its uniformity. The experiments were effected in quartz sand which was boiled several times in hydrochloric and nitric acids and then washed in distilled water until the resistance of the pore solution did not reach the resistance of the distilled water (2 500 Ωm). It was found that the chemical composition of the pore moisture influenced the induced polarisation only through the specific resistance and the ζ-potential. For an equal specific resistance of the specimens, the induced polarisation will be the larger, the larger the negative ζ-potential. In the case of a constant ζ-potential, the induced polarisation is proportional to the specific resistance of the specimen, but the speed of the drop does not depend on the specific resistance. In moisture-saturated sands with a re-charged, twin electric layer, the induced polarisation approaches zero and does not depend on the ζ-potential. However, in specimens which were not moisture-saturated, but did have a

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49-12-15/16

Dissertations Defended in the Scientific Council of the Institute of Physics of the Earth, Institute of Physics of the Atmosphere and Institute of Applied Geophysics, Ac.Sc. USSR during the First Semester of 1957.

re-charged, twin, electric layer, the induced polarisation increases sharply with increasing ζ-potential. On reducing the humidity, the induced polarisation increases proportionally with the specific resistance of the specimen, but for low humidity contents, this increase slows down, the induced polarisation passes through a maximum and then decreases, although the specific resistance of the specimen continues to increase. The author has proved the existence of a certain dependence of the induced polarisation on the degree of dispersion and thereby he indicated the possibility of applying the method of induced polarisation for coring oil deposits for the purpose of determining the permeability and the specific conductivity of rocks. He also obtained the relation between the speed of fall of the induced polarisation and the degree of dispersion. For sands, the speed of fall is the higher the finer the sand. This result seems to favour the view that when passing an electric current through the specimen, each sand grain is similar to an electric dipole and the drop

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49-12-15/16

Dissertations Defended in the Scientific Council of the Institute of Physics of the Earth, Institute of Physics of the Atmosphere and Institute of Applied Geophysics, Ac.Sc. USSR during the First Semester of 1957.

in the induced polarisation represents the total field of the discharge of these dipoles. The fundamental relations of induced polarisation of ion-conducting rocks were clarified, starting off by taking into consideration the forces acting on the charges of the diffusion part of the twin, electric layer. In the equilibrium state (in the absence of current flow), the only force maintaining the charges of the diffusion layer around the surface is the electro-static attraction from the charges of the fixed layer; therefore, the surface density of the charges of the diffusion layer at each point of the surface equals the density of the charges of the fixed layer. It can be assumed that on applying an external electric field, the surface density of the charges does not change in the fixed layer (or changes much less than in the diffusion layer).

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49-12-15/16

Dissertations Defended in the Scientific Council of the Institute of Physics of the Earth, Institute of Physics of the Atmosphere and Institute of Applied Geophysics, Ac.Sc. USSR during the First Semester in 1957.

E.I. Parkhomenko - Piezo-electric Effect of Rocks (P'ezoelektricheskiy effekt gornykh porod) - Candidate dissertation. Opponents: Doctor of Physico-Mathematical Sciences V.F. Bonchkovskiy, Candidate of Physico-Mathematical Sciences I.S. Zholudev, Candidate of Technical Sciences B.A. Bazhenov. July 21, 1957.

For many centuries, the descriptions of earthquakes mentioned the light effects, but the physical nature of the latter was not known. With the development of investigations in electricity and improved instrumentation, the electrical character of these phenomena was established. Only individual statements of hypothetic character exist on the sources of the changes of the electrical field of the Earth. In view of the importance of this problem of a possible relation between the electro-magnetic and the seismic fields, the author studied the electrical effects in rocks subjected to mechanical forces. By means of a dynamic method, a piezo-electric effect was observed in rocks (granite, gneiss, quartzites, etc.) containing quartz grains which are orientated in a specific way. In the

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Dissertations Defended in the Scientific Council of the Institute of Physics of the Earth, Institute of Physics of the Atmosphere and Institute of Applied Geophysics, Ac.Sc. USSR during the First Semester of 1957.

absence of orientation of the quartz grains, no piezo-electric effect was observed. Under laboratory conditions, the existence of the E effect discovered by A.G. Ivanov, was confirmed and also its relation to the presence of a liquid phase in rocks. On the basis of investigation of ideal piezo-electric textures of quartz in accordance with the theory of A.V. Shubnikov, it was found that from a single modification of quartz, it is possible to form piezo-electric textures of the first kind, type ∞ and ∞:2 and of two shapes of quartz, it is possible to form a texture of the type ∞.m . The possibility was elucidated of ordinating quartz-containing rocks to piezo-electric textures of the type ∞.m and also to the symmetry class 3:2. A technique was developed of the qualitative measurement of the piezo-electric moduli of rocks in the case of longitudinal and transverse effects, by the static method applying an electrometer. It is shown that in rock specimens of volumes of the order of 10 cm^3, the piezo-

Card 20/21 electric effect can be observed owing to the non-compensated

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49-12-15/16

Dissertations Defended in the Scientific Council of the Institute of Physics of the Earth, Institute of Physics of the Atmosphere and Institute of Applied Geophysics, Ac.Sc. USSR during the First Semester of 1957.

effect of the individual quartz grains. On the basis of experimental data, the coefficient of orientation of the quartz grains was calculated with some degree of approximation in various rocks by means of the formula of Zheludev. Model tests on granite blocks enabled establishment (in addition to an elastic wave) of two types of electro-magnetic oscillations. Oscillations of one type precede the arrival of the elastic wave and coincide with the incident of emission, oscillations of the other type are recorded at about the same time as the elastic wave. The oscillations of the first type are caused by the piezo effect of the granite block near the emmitter of the ultra-sound, whilst oscillations of the second type are caused by the piezo-electric effect of the same granite near to the receiver. The results of these experiments can be applied in studying the physics of earthquakes and also for developing new methods of electric prospecting.

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

3(7),24(4) SOV/20-123-2-16/50

AUTHOR: Pyaskovskaya-Fesenkova, Ye. V.

TITLE: On Some Optical Properties of the Atmosphere of the Lybian Desert (O nekotorykh opticheskikh svoystvakh atmosfery liviyskoy pustyni)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 2, pp 269-271 (USSR)

ABSTRACT: The authoress and her collaborators carried out investigations in Egypt (October-November 1957) in connection with the program of the International Geophysical Year. The expedition worked in the Libyan desert south of Assuan ($\varphi = 23^o59'$, $\chi = 32^o52'$) in a distance of 1 km from the river Nile and about 200 km west of the Red Sea. The following was found: The optical properties of the atmosphere are very constant in the forenoon and afternoon hours. Nevertheless, this constancy was disturbed for several hours at about noon, after which the atmosphere became more transparent than in the forenoon, a phenomenon that is only very rarely observed in the USSR. The aureole of the sun was weaker in the afternoon than in the forenoon. The atmosphere at the place where observations were carried out was very homogeneous in optical respect on cloud-

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less days. A schematical drawing shows 2 scattering indicatrices which were determined on October 25 on the basis of observations of the brightness of the sky along the entire almucantar of the sun with a zenith distance of $z = 74^{o}$. These two indicatrices hardly differ at all from each other. There was no fine atmospheric dust, there was little moisture, and it was probably for this reason that a green shine became noticeable nearly every evening before sunset. The increase of transparency in the afternoon influenced the polarization properties of the atmosphere. The degree of polarization of the sky by day is always less high in the afternoon than in the forenoon. The authoress determined the direction and the amount of polarization by means of a visual photometer described in one of her earlier papers (Ref 2). The degree of polarization attains very high values; it is higher in the afternoon than in the forenoon, and immediately after sunset it rose to 80 %. A diagram shows the course of the degree of polarization in the almucantar of the sun at an angular distance of $\vartheta = 90^{o}$ to the sun, as a function of the atmospheric mass m in the direction towards the sun. This curve describes

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On Some Optical Properties of the Atmosphere of the Lybian Desert SOV/20-123-2-16/50

the observations made on November 16 from z = 87°2' in the morning to 87°34' in the evening. When the light is scattered in the first order, the direction of the oscillation plane must be vertical to the plane of vision. In the forenoon of November 16, the transparency coefficient amounted to p = 0.85, and the difference between the measured and the theoretical plane of oscillation remained constant (~2°). In the afternoon (p = 0.89) these two planes were in agreement. There are 4 figures and 4 references, 3 of which are Soviet.

PRESENTED: July 12, 1958, by V. G. Fesenkov, Academician

SUBMITTED: July 12, 1958

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3(7)

AUTHOR: Pyaskovskaya-Fesenkova, Ye. V. SOV/20-123-6-14/50

TITLE: On the Scattering and Polarization of Light in the Atmosphere Under the Conditions of the Lybian Desert (O rasseyanii i polyarizatsii sveta v atmosfere v usloviyakh Liviyskoy pustyni)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 6, pp 1006-1009 (USSR)

ABSTRACT: The authoress investigated the luminosity and the polarization of the daylight sky in October-November 1957 in the Lybian Desert 20 km south of Assouan ($\varphi = 23°59'$, $\lambda = 32°52'$, $h \sim 200$m) by means of a visual photometer provided with a yellow Schott (Shot) filter and with a polaroid. The degree and the angle of polarization were determined according to the method of V. G. Fesenkov, according to which the luminosity of the investigated point of the sky is measured through a polaroid at 3 positions B_1, B_2, B_3 at various angular distances ϑ from the sun in the solar almucantarat. (These points on the sky and the sun have the same distance from the zenith). The angular distances between the positions B_1, B_2, and B_3 amount to 60°. Moreover, the authoress measured the luminosity of a plane

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On the Scattering and Polarization of Light in the Atmosphere Under the Conditions of the Lybian Desert SOV/20-123-6-14/50

perpendicular to the sunbeam. From these data, the degree of polarization, the orientation of the plane of the light vibrations, the total luminosity B, and the scattering indicatrix could be determined. Moreover, the scattering indicatrix could be divided into 2 components. One of them is the indicatrix of the scattering in natural beams, the other one, in polarized beams. Moreover, the total scattering indicatrix was subdivided into 2 other components: one of them corresponds to molecular scattering, the other to aerosol scattering. Finally, the authoress tried to separate out the degree of polarization caused by aerosols and to subdivide the aerosol indicatrix into 2 indicatrices which correspond to natural and to polarized beams. A diagram shows the distribution of the polarization degree P along the almucantarat of the sun. The maximum polarization degree was at $\sim\vartheta = 90^{\circ}$ and was equal to 74%. The second diagram gives the orientation of the plane of the light vibrations with respect to the corresponding vertical as a function of the angular distance ϑ from the sun. The third diagram shows the total indicatrix in polar coordinates. A formula is then given for the intensity of the polarized light.

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On the Scattering and Polarization of Light in the Atmosphere Under the Conditions of the Lybian Desert

SOV/20-123-6-14/50

In first approximation, there is no atmospheric depolarization and the total polarization consists of 2 components which are caused by molecules and aerosols, respectively. There are 4 figures and 3 Soviet references.

..._SENTED: August 11, 1958, by V. G. Fesenkov, Academician

SUBMITTED: August 8, 1958

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23933
S/035/61/000/006/015/044
A001/A101

3.1510

AUTHOR: Pyaskovskaya-Fesenkova, Ye.V.

TITLE: Some data on sky polarization in southern Egypt

PERIODICAL: Referativnyy zhurnal. Astronomiya i Geodeziya, no. 6, 1961, 26-27, abstract 6A231 ("Izv. Astrofiz. in-ta AN KazSSR", 1959, v. 8, 82-97, Engl. summary)

TEXT: The author describes the results of observations on atmospheric optics in southern Egypt, conducted by an expedition of the Academy of Sciences, USSR, in the fall 1957. A visual photometer of daily sky (for measuring the brightness and polarization of the sky) and a photoelectric photometer (for observations of circumsolar aureole and control of stability of the atmosphere optical properties) were used. It was found out that in the region investigated a good stability was observed before and after noon, which was disturbed only about noon (followed by aureole decrease). In the USSR usually the aureole grows after noon. Almost every evening a green ray was observed. Polarization degree after noon increased. The V.G. Fesenkov method (Astron. zh., 1935, v. 12, no. 4), which consists in measuring the brightness of a given sky point at three polaroid positions, X

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Some data on sky polarization in southern Egypt

was employed for determining degree and angle of polarization. These measurements were performed in almucantar of the Sun and in zenith. The observed polarization angle β_{obs} (between the vertical and the plane of light oscillations) was compared with that calculated theoretically (β_{th}) for first-order scattering. At high transparency the difference between them amounted to 1-2°. In four cases out of 5, polarization maximum in almucantar of the Sun was at scattering angle $\mathcal{V} = 60°$, i.e., the plane of light oscillations in the real atmosphere coincides with the similar plane at first-order scattering (if transparency is sufficiently high) in proximity of this angle. The author presents components of the summary scattering indicatrix in natural light μ' and in polarized light μ'', determined from observations in almucantar of the Sun. Component μ' varies from day to day more than μ''. An attempt is made to single out polarization dependent on aerosol component from the observed (summary) polarization.

G. Livshits

[Abstracter's note: Complete translation]

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23932
S/035/61/000/006/014/044
A001/A101

3,1510

AUTH.: Pyaskovskaya-Fesenkova, Ye.V.

TITLE: Certain relations in the phenomenon of sky polarization

PERIODICAL: Referativnyy zhurnal. Astronomiya i Geodeziya, no. 6, 1961, 26, abstract 6A230 ("Izv. Astrofiz. in-ta AN KazSSR", 1960, v. 10, 64-70, Engl. summary)

TEXT: The author describes the results of observations of brightness and polarization of the clear sky along the almucantar of the Sun at its different heights in the region of the Mountainous Observatory of the Astrophysical Institue, AS KazSSR. The photometer was described by the author earlier (RZhAstr, 1960, no. 5, 4036). Polarization was determined by the V.G. Fesenkov method (measuring sky brightness at three positions of the polaroid (see RZhAstr, 1959, no. 5, 3556). Observations, which were conducted on sky points over mountains and lowlands, have shown that polarization degree was almost the same at equal angular distances to the Sun. Polarization degree P at different scattering angles turned out often to be proportional to "Rayleigh" polarization degree: $P = kP_R$. This relation holds sometimes also at poor transparency. On the other hand, deviations from the Ray-

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leigh law may often happen to be very significant. Observations permitted the singling out of summary indicatrix $\mu(\vartheta)$, indicatrix in natural rays $\mu'(\vartheta)$ and in polarized rays $\mu''(\vartheta)$ (ϑ is scattering angle). A comparison of observational data in different places clarified the problem of relation between μ' and μ' at different atmospheric transparency p. It has been found out that $\mu'(90^\circ)$ and $\mu'(90^\circ)$ vary linearly with p and, consequently, the change of a scattered flux in natural light is greater than in a polarized one. This is connected with a lesser light polarization on aerosols (in comparison with molecular polarization).

G. Livshits

[Abstracter's note: Complete translation]

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68983
S/020/60/131/02/022/071
B013/B011

3.9000

AUTHOR: Pyaskovskaya-Fesenkova, Ye. V.

TITLE: Some Data on the Polarization of Light by the Atmosphere

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 131, Nr 2, pp 297-299 (USSR)

ABSTRACT: The author reports on observations made concerning the brightness and polarization of the clear sky along the almucantar of the sun on the mountain observatory of the Astrofizicheskiy institut AN KazSSR (Institute of Astrophysics of the AS of the Kazakhskaya SSR) in the surroundings of Alma Ata (h=1450 m) in August, 1956, in the Aksengerskiy sovkhoz in the surroundings of Alma Ata (h=500 m) in June - July, 1957, and in the Lybian Desert (Egypt) (h=200 m) in October - November, 1957. Observations were made by means of a visual photometer with a yellow Schott filter. Polarization was determined according to V. G. Fesenkov's procedure. The brightness of the celestial point under investigation was measured by a polaroid with three different positions. Polarization degree and direction of the polarization plane can be determined in a similar way. The degree of polarization was determined by the formula

$$P(\vartheta) = \frac{2\sqrt{B_1(B_1-B_2)+B_2(B_2-B_3)+B_3(B_3-B_1)}}{B_1 + B_2 + B_3}$$

, where B_1, B_2, B_3 denote the brightness of the celestial point observed with the three above-

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Some Data on the Polarization of Light by the Atmosphere

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mentioned positions. On certain days, the influence exerted by aerosols in a real atmosphere manifests itself only by a certain decrease of the polarization degree

$$P_R(\vartheta) = \frac{\sin^2 \vartheta}{1 + \cos^2 \vartheta},$$

namely, in the same ratio for all scattering angles ϑ. Hence, $P(\vartheta) = kP_R(\vartheta)$ holds for these days, with k denoting the maximum polarization degree in the almucantar of the sun (for $\vartheta = 90^\circ$). Such a proportionality does not depend on the atmospheric transparency. The last-mentioned equation is satisfied well with bad transparency, and poorly in the case of good transparency. Examples are offered. On the basis of observations of the sky brightness along the almucantar of the sun with the three above-mentioned positions of the polaroid it was possible to determine the scattered light flux $\mu(\vartheta)$ for different scattering angles ϑ and to subdivide it into two parts, namely, into natural rays $\mu'(\vartheta)$ and into polarized rays $\mu''(\vartheta)$. The ratio between these two scattered fluxes changes with a change in the atmospheric visibility. $\mu'(90^\circ)$ rises more quickly with increasing atmospheric dullness than $\mu''(90^\circ)$. Aerosols perhaps polarize the light to a lesser degree than molecules. For this reason, the scattered flux in the case of an increased quantity of aerosols

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Some Data on the Polarization of Light by the Atmosphere

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is likely to grow more slowly in polarized rays than in natural rays. $\mu'(\nu^{h})$ and $\mu''(\nu^{h})$ are likely to depend linearly on the atmospheric transparency. There are 4 figures, 1 table, and 3 references, 2 of which are Soviet.

PRESENTED: December 3, 1959, by V.G. Fesenkov, Academician

SUBMITTED: December 2, 1959

Card 3/3

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S/020/60/134/004/010/023
B019/B067

3.1800 (1041,1062,1168)

AUTHOR: Pyaskovskaya-Fesenkova, Ye. V.

TITLE: Determination of the Transmission Coefficient of the Atmosphere From the Polarization of the Sky Light

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 4, pp. 812 - 815

TEXT: From 1956 to 1957 the author studied the sky brightness by means of a polaroid and a photometer on a mountain observatory (1450 m above sea level) in the Aksengerskiy sovkhoz (Aksengir (?) sovkhoz) near Alma-Ata and also in the Liviyskaya pustina Yegipetskogo rayon. They also measured solar radiation and the brightness of the solar corona. These measurements were made at the mountain observatory by N. I. Ovchinnikova, in the Aksengerskiy sovnarkhoz by P. N. Boyko, and in the Liviyskaya pustina by V. M. Kazachevskiy and P. N. Boyko. The observations were made by means of photometers with yellow Schott glass filter. The effective wavelength in the system glass - yellow screen was calculated from formula

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

Determination of the Transmission Coefficient of the Atmosphere From the Polarization of the Sky Light S/020/60/134/004/010/023 B019/B067

$$\lambda_o = \frac{\int_0^\infty E_\lambda p'_\lambda \varepsilon_\lambda \lambda \, d\lambda}{\int_0^\infty E_\lambda p'_\lambda \varepsilon_\lambda \, d\lambda} \qquad (1) .$$

E_λ denotes the energy distribution in the spectrum of the light source, p'_λ the transparency of the filter, ε_λ the spectral sensitivity of the glass. Absolutely black bodies with temperatures of T = 20,000°K, 4,000°K and the sun (t = 6,000°K) were studied. Results: λ_o = 560 mμ at 20,000°K, λ_o = 565 mμ at 6,000°K, and λ_o = 568 mμ at 4,000°K. For a light source of E_λ = const, λ_o was found to be 567. The effective wavelength in the system selenium photocell - yellow screen was calculated from formula

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Determination of the Transmission Coefficient of the Atmosphere From the Polarization of the Sky Light S/020/60/134/004/010/023 B019/B067

$$\lambda_0 = \frac{\int_0^\infty E_\lambda p'_\lambda \varepsilon_\lambda p^m_\lambda \lambda \, d\lambda}{\int_0^\infty E_\lambda p'_\lambda \varepsilon_\lambda p^m_\lambda \, d\lambda} \qquad (2) \quad .$$

Here, E_λ is the energy distribution in the solar spectrum at the atmosphere boundary, ε_λ the spectral sensitivity of the photocell, p_λ the spectral transmission coefficient, and m the atmospheric mass in the direction of the sun. For m = 1, λ_0 was found to be 577, and for m = 5.6, λ_0 was found to be 582. The degree of polarization was calculated from formula $P = 2\sqrt{B_1(B_1-B_2) + B_2(B_2-B_3) + B_3(B_3-B_1)}/(B_1+B_2+B_3)$ (3). B_i are the three brightnesses of the sky measured by V. G. Fesenkov's method by means of the polaroid. The transparency coefficients were measured by three different methods: 1) from solar radiation according to Buger; 2) from measurements of the sky brightness at an angular distance of 60°

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Determination of the Transmission Coefficient of the Atmosphere From the Polarization of the Sky Light S/020/60/134/004/010/023 B019/B067

from the sun, and by a method suggested by the author with the aid of formula $p = 0.973 - 9.80B(60^{o})/E_{m}m$ (4); 3) from measurements of the solar corona at the moment of its maximum brightness, by the aid of formula: $\log p = -M/m_{max}$ (5). In Fig. 1 $P = f(p)$ is graphically represented according to measurements at the three localities mentioned initially with scattering angles of 40^{o}, 60^{o}, and 90^{o}. The author points to the nonlinear character of this dependence which is not locally dependent within the measurement error. Furthermore, $P = f(\tau)$ is graphically represented (Fig. 2) where τ denotes the optical path of the atmosphere. The relation $\ln\tau = 0.035 - 1.344P$ (6) is given for this case. For $\tau = 0.05$ the author calculated a polarization at 90^{o} of 100%, at 60^{o} of 60%, and at 40^{o} of 26% with a transparency coefficient of 0.95. By taking account of an effective wavelength in the system glass - screen of 564 mμ the author obtains a 83% polarization at a scattering angle of 90^{o} at sea level, and an 87% polarization at the mountain observatory. There are 2 figures and 1 Soviet reference.

PRESENTED: May 3, 1960, by V. G. Fesenkov, Academician
SUBMITTED: April 27, 1960

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

PYASKOVSKAYA-FESENKOVA, YE.V. (Alma-ata)

"Some results of investigation about atmospheris scattering and polarization of the day skylight."

Report submitted in connection with the Symposium on Radiation. Vienna, Austria 14-19 Aug 1961.

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S/169/62/000/003/047/098
D228/D301

AUTHOR: Pyaskovskaya-Fesenkova, Ye. V.

TITLE: Daytime sky polarization (Theses)

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 3, 1962, 26, abstract 3B212 (V sb. Aktinometriya i atmosfern. optika, L., Gidormeteoizdat, 1961, 103-104)

TEXT: The results of sky brightness observations, carried out in the Libyan desert, in southern Egypt, and at a mountain observatory near Alma-Ata, are analysed. V. G. Fesenkov's method was used in determining the degree of sky-dispersed light polarization and the orientation of the plane of the electrical vector's variations. An attempt was made to distinguish from the summary radiation, observed along the sun's almacantar, the radiation that depends on the presence of aerosols in the atmosphere. The maximum of the aerosol component of the polarization can be observed at an angular distance of 110 - 120° from the sun and amounts to 40%. /Abstracter's note: Complete translation./

Card 1/1

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3,5150

S/169/62/000/003/061/098
D228/D301

AUTHOR: Pyaskovskaya-Fesenkova, Ye. V.

TITLE: Methods of determining the coefficient of atmospheric transparency from the sky brightness (Theses)

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 3, 1962, 28, abstract 3B232 (V sb. Aktinometriya i atmosfern. optika, L., Gidrometeoizdat, 1961, 144)

TEXT: Three methods of determining the coefficient of transparency are suggested: 1) From the moment of onset of the brightness maximum of the circumsolar halo, since in this case there is a very simple relationship; 2) from the indicatrix of dispersion when true absorption is absent; and 3) from empirical formulas, derived on the basis of much observational material. /Abstracter's note: Complete translation./

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Card 1/1

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

S/035/61/000/012/008/043
A001/A101

AUTHORS: Pyaskovskaya-Fesenkova, Ye.V., Boyko, P.N., Belyak, G.M., Boyko, V.V.

TITLE: Some data on attenuation and dispersion of light at various altitudes above sea level

PERIODICAL: Referativnyy zhurnal. Astronomiya i Geodeziya, no. 12, 1961, 33, abstract 12A285 ("Izv. Astrofiz. in-ta AN KazSSR", 1961, v. 11, 78 - 88, Engl. summary)

TEXT: Brightness of daily sky on the Sun's almucantar was measured simultaneously at two points θ = 57 and 60° at the Mountain - Observatory of the Astrophysical Institute, AS KazSSR, and on the Kumbel' mountain. A visual photometer and a photoelectrical photometer with selenium photoelement were used. Transparency coefficients (P), optical thicknesses of atmosphere (τ) and scattering indicatrices $\mu(\theta)$ were determined from the measurement data. It is noted that transparency coefficients over the lowland and mountains differ only slightly. Linke's turbidity factor increases in afternoon hours in comparison with morning

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Some data on attenuation ... S/035/61/000/012/008/043
A001/A101

hours, and this increase is more noticeable at the Observatory than on the Kumbel' mountain. Absolute scattering indicatrices on the Kumbel' mountain on 29 August prior and after noon increased by 30 - 85%.

V. Golikov

[Abstracter's note: Complete translation]

Card 2/2

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

S/913/62/003/000/002/033
D405/D301

AUTHOR: Pyaskovskaya-Fesenkova, Ye. V.

TITLE: Development of atmospheric optics in Kazakhstan

SOURCE: Akademiya nauk Kazakhskoy SSR. Astrofizicheskiy institut. Trudy. v. 3, 1962. Rasseyaniye i polyarizatsiya sveta v zemnoy atmosfere; materialy Soveshchaniya po rasseyaniyu i polyarizatsii sveta v atmosfere. 14 - 25

TEXT: The study of atmospheric optics in Kazakhstan was initiated in September 1941, when eight expeditions from various parts of the USSR arrived there to study the total solar eclipse. Soon afterwards it was decided by the Council of Ministers of the USSR (at the initiative of V.G. Fesenkov) to create the Institute of Astronomy and Physics at the Kazakh Branch of the Academy of Sciences USSR. The early days of the Institute coincided with the difficult stage of the Second World War, so that great obstacles were encountered in instrument construction. Many instruments

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S/913/62/003/000/002/033
Development of atmospheric optics ... D405/D301

were constructed by the scientists themselves, in particular V.G. Fesenkov; among these were an instrument for laboratory determination of the scattering function in turbid media and an instrument for the determination of the absolute albedo of reflecting surfaces. In 1950 the Institute of Astronomy and Physics was divided into two: the Astrophysical Institute and the Physicotechnical Institute; in addition an independent Section for Astrobotany was created. The Astrophysical Institute moved to the Kamensk Plateau. Various expeditions were organized, mainly inside Kazakhstan; among them: to the Kumbel' Mountain (3200 m) and the Great Alma-Ata Lake, the Sary-Ishik-Otrau desert (near the Balkhash Sea), etc. Other expeditions led to the Sikhote-Alin'sk Mountain Range in the Far East, and to the Black-Sea (Gudaut). During the International Geophysical Year 1957, an expedition was sent to Egypt where it worked in the desert South of the town of Assuan. The research of the Atmospheric-Optics Section was mainly concerned with the scattering capacity of the atmosphere, the extinction of light by the atmosphere, solar halos, the energy distribution in the spectrum of the diurnal sky, etc. In recent years, the polarization of light of the diurnal sky was

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S/913/62/003/000/002/033
Development of atmospheric optics . D405/D301

investigated, as well as the scattering of light in the bottom layer of the atmosphere. For this purpose three new instruments were constructed: a spectro-electropolarimeter with automatic recording of spectra, a diurnal-sky electropolarimeter using a photomultiplier, and a two-channel polarimeter which enables to directly determine the 3 first parameters of Stokes (intensity, difference between intensities at two mutually perpendicular directions, and the angle of the polarization plane. The polarization in the lower atmosphere was studied by a specially-designed photoelectric photometer. Here are some of the results of nearly 20 years of research in atmospheric optics: The solar halo attains its highest brightness when the direct solar radiation is attenuated by a factor e (the base of natural logarithms) in the direction of the line of sight. The sky brightness with respect to the solar illumination does not depend, at an angular distance of 57° from the Sun, on the form of the scattering function. The nature of the latter is the same irrespective of climatic- and meteorologic conditions. Among the theoretical studies are V.G. Fesenkov's theory of vertical visibility, etc., and the new method

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Development of atmospheric optics .. S/913/62/003/000/002/033
D405/D301

of determination of light scattering of higher order, proposed by the author. The main work of the Astrobotanical Section dealt with the hypothese on plant life on Mars. In conclusion, the author notes the great advantages which Kazakhstan offers (in particular through its atmospheric stability) for research in atmospheric optics. There are 8 figures.

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

S/913/62/003/000/003/033
D405/D301

AUTHOR: Pyaskovskaya-Fesenkova, Ye. V.

TITLE: Some data on sky brightness

SOURCE: Akademiya nauk Kazakhskoy SSR. Astrofizicheskiy institut. Trudy. v. 3, 1962. Rasseyaniye i polyarizatsiya sveta v zemnoy atmosfere; materialy Soveshchaniya po rasseyaniyu i polyarizatsii sveta v atmosfere. 26 - 30

TEXT: The variations are ascertained of the directional scattering coefficient μ pertaining to points of the sky which do not belong to the solar almacantar parallel of altitude. For this purpose the author observed the brightness of sky points which do not change their zenith distance with time, while their azimuth changes; (the angular distance from the Sun ϑ was the same for all the points). The observations were conducted at the mountain observatory of the Astrophysical Institute of the AS KazakhSSR near Alma-Ata. In this region the atmosphere is quite frequently

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Some data on sky brightness S/913/62/003/000/003/033
D405/D301

homogeneous in the horizontal direction. The directional scattering coefficients were determined by a well known formula of sky brightness in which multiple scattering is neglected. From figures plotting the coefficient μ as a function of atmospheric mass, the following conclusions were obtained: At constant angular distance from the Sun the directional scattering coefficient μ decreases when the Sun approaches the horizon (the zenith distance of the point under consideration remaining fixed); it remains constant for the solar almacantar; it decreases, when the Sun approaches the horizon, for points which are on an almacantar that is higher than the solar almacantar and which move together with the latter so that $z-\zeta$=const (z denoting the zenith distance of the Sun, and ζ the zenith distance of the point under consideration); it increases, when the Sun approaches the horizon, for points which are on an almacantar lower than the solar and move together with latter as above. These results are discussed in relation to such factors as the decreasing atmospheric density with altitude, multiple scattering, ground reflection, etc. It is noted that the observations of light polarization confirm the above results. There are 3 figures.

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S/913/62/003/000/013/033
D405/D301

AUTHOR: Pyaskovskaya-Fesenkova, Ye. V.

TITLE: On the effective sky-brightness layer

SOURCE: Akademiya nauk Kazakhskoy SSR. Astrofizicheskiy institut. Trudy. v. 3. 1962. Rasseyaniye i polyarizatsiya sveta v zemnoy atmosfere; materialy Soveshchaniya po rasseyaniyu i polyarizatsii sveta v atmosfere. 83 - 88

TEXT: The height h_0 of the effective-brightness layer is defined by a formula involving integrals of the brightness B_h. Thereby it is assumed that the atmosphere consists of thin plane-parallel homogeneous layers, that the density and optical thickness of the atmosphere decrease exponentially, and that multiple scattering and light reflection from the ground are absent. After evaluating the integrals, the author illustrates the method of calculation by a numerical example. On the basis of this example the following conclusions are obtained: 1) For celestial points of fixed zenith

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On the effective sky-brightness ... D405/D301

distance and angular distance from the Sun, the height h_0 increases when the Sun approaches the horizon. Hence in this case the lower atmospheric layers become less and less effective. 2) For a fixed position of the Sun, h_0 decreases for celestial points from zenith to horizon. 3) For the points of the solar almacantar, h_0 remains fixed when the zenith distance of the Sun varies, being equal to the height of the homogeneous atmosphere. 4) For any celestial point, h_0 attains its maximum value when the zenith distance of the Sun is 90°. The maximum possible value of h_0 for a given optical thickness τ occurs at the zenith, when the Sun is at the horizon; for $\tau = 0.2$ this maximum value is 20 km. 5) The value of h_0 is larger than the height of the atmosphere H for the points above the solar almacantar, and smaller than H for the points below it. There are 2 figures.

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S/913/62/003/000/021/033
D405/D301

AUTHOR: Pyaskovskaya-Fesenkova, Ye. V.

TITLE: Atmospheric polarization with allowance for multiple scattering

SOURCE: Akademiya nauk Kazakhskoy SSR. Astrofizicheskiy institut. Trudy. v. 3. 1962. Rasseyaniye i polarizatsiya sveta v zemnoy atmosfere; materialy Soveshchaniya po rasseyaniyu i polyarizatsii sveta v atmosfere. 133-142

TEXT: The author determined the atmospheric of light from sky-brightness observations. The method and formulas of V.G. Fesenkov were used. The method consists in measuring the brightness by a polaroid at three of its positions which are at an angular distance of 60^{o} from each other. The observations were conducted at 3 sites: 2 in the neighborhood of Alma-Ata and the third in the Libian Desert (Southern Egypt). The optical thickness of the atmosphere τ was determined by an empirical method proposed by the author.

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Atmospheric polarization ... S/913/62/003/000/021/033
D405/D301

Thereby the effects of multiple scattering, of ground reflection, and those due to the presence of aerosols, are taken into account; it is assumed that the multiple-scattering intensity is not dependent on azimuth. The method was verified theoretically; it was shown that, under certain conditions, the method involves an error of a few percent only. In order to separate the integral and aerosol scattering functions into polarized and non-polarized light components, the author neglected the polarization of the multiply-scattered light. The reasons for such an assumption are set forth. From the curves representing the degree of polarization as a function of the scattering angle it is evident that, for a transparency coefficient of 0.88, the effect of multiple scattering is negligibly small; on the other hand, for a transparency coefficient of 0.80 it is no longer possible to neglect the multiple scattering. The aerosol degree of polarization, just as the integral one, increases with atmospheric transparency; for a transparency coefficient of 0.88, the degree of polarization of light scattered by aerosols was found to be 36%, and for a transparency coefficient of 0.80 it was 29%. There are 6 figures and 1 table.

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

PYASKOVSKAYA-FESENKOVA, Ye.V.

Indicatrices of light scattering at snow cover. Izv.Astrofiz. inst.AN Kazakh.SSR 15:117-120 '62. (MIRA 16:1)
(Light--Scattering)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

PYASKOVSKAYA-FESENKOVA, Ye.V., doktor fiziko-matematicheskikh nauk

Conference on problems of atmospheric scattering and polarization of light. Vest.AN Kazakh.SSR 18 no.5:81-82 My '62. (MIRA 17:10)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

PYASKOVSKAYA-FESENKOVA, Ye.V.

Some polarizing properties of the daytime sky. Izv. AN Kazakh. SSR. Ser. fiz.-mat.nauk no.1 83-92 '63. (MIRA 17:4)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

ACC NR: AR6035286 SOURCE CODE: UR/0269/66/000/009/0027/0027

AUTHOR: Pyaskovskaya-Fesenkova, Ye. V.

TITLE: Atmospheric polarization of light with dry and wet aerosols

SOURCE: Ref. zh. Astronomiya, Abs. 9.51.245

REF SOURCE: Tr. Astrofiz. in-ta. AN KazSSR. v. 7, 1966, 79-84

TOPIC TAGS: atmospheric optics, optics, light polarization, aerosol, light scattering

ABSTRACT: Data are presented on the polarization of light scattered in the daytime at differenct points in the sky in various localities principally along the solar almucantar. The observations showed that at the same atmospheric optical thickness, the degree of polarization (P) is approximately 10% less when dry aerosols predominate over moist ones. If multiple scattering is assumed to be nonpolarized and independent of the azimuth, then the computer degree of aerosol component (P_a) polarization is independent of atmospheric transparency. The mean value of P_a in a location with predominantly moist aerosols was found to be greater (50.3%)

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ACC NR: AR6035286

than with predominately dry aerosols (28.5%). In computing P_a, molecular anisotropy was not taken into account, which reduces the values obtained by 2—3%. It is assumed that the differences observed in the degree of polarization are explained by the difference in the polarization properties of dry and moist aerosols. [Translation of abstract] [SP]

SUB CODE: 03/

Card 2/2

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

LIVSHITS, G.Sh.; FESENKOV, V.G., akademik, red.; IDLIS, G.M., doktor fiz.-matem.nauk, zamestitel' red.; PYASKOVSKAYA-FESENKOVA, Ye.V., doktor fiz.-matem.nauk, red.; ROZHKOVSKIY, D.A., doktor fiz.-matem, nauk, red. toma; RUDINA, M.P., kand.fiz.-matem.nauk, red.; ROZHKOVSKIY, D.A., doktor fiz.-matem.nauk, red.

[Light scattering in the atmosphere. Pt.1.] Rasseianie sveta v atmosfere. Alma-Ata, Nauka. Pt.1. 1965. 176p (Akademiia nauk Kazakhskoi SSR. Astrofizicheskii institut. Trudy, vol.6)

(MIRA 18:5)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

Name: PYASKOVSKIY, Anatoliy Vladimirovich

Dissertation: The Revolution in Turkestan in the years 1905-1907

Degree: Doc Historical Sci

Affiliation: [not indicated]

Defense Date, Place: 27 Feb 56, Council of Inst of History, Acad Sci USSR

Certification Date: 15 Sep 56

Source: BMVO 6/57

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

P'YASKOVSKIY, B. [P"iaskovs'kyi, B.]

Problem of the antiworld. Nauka i zhyttia 10 no. 12:53 D '60.
(MIRA 14:4)

(Matter)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

PYASKOVSKIY, B. [Piaskovs'kyi, B.]

Valuable beginnings. Dop.AN URSR no.4:562-564 '60. (MIRA 13:7)
(Euler, Leonard, 1707-1783)
(Liapunov, Aleksandr Mikhailovich, 1857-1918)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

The problem of desert crusts. B. V. Pyashkovskii. *Pedology* (U. S. S. R.) 26, 96–107(1931).—P. cites the formation of crusts formed on rocks in the Dnieper River. Analyses of several samples are given, showing that many of them contain Mn, which apparently produces the dark color. The various constituents found in the crusts are pptd. from water, in which the Mn and Fe are in the form of bicarbonates, when the rocks are exposed to the air. The discovery of such crusts in any region can, therefore, not be taken as an indication of a desert type of climate. J. S. Joffe

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

PYASKOVSKIY, B. V.

Moscow

"Loess as a deep soil formaticn"

Pochvovedeniye, No. 11, 1946.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

PYASKOVSKIY, B. V.

USSR (600)

Sponges

Paleogenic sponges in an exceptional state of preservation. Priroda 41 no 1, 1952

9. Monthly List of Russian Accessions, Library of Congress, May 1952, Unclassified.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

PYASKOVSKIY, B.V.

What Is Loess? Materialy po inzh. geologii, No 3, 1953, 56-68

The aughor analyzes the ideas of L. S. Berg, who explained the origin of loess from the viewpoint of soil-formation processes and refuted the aeolian theory. In the formation of loess two stages are distinguished: accumulation of fine earth (the matrix of loess), and its process of loess forming. The author's opinion is that loess is formed under the humus layer of steppe soils and is a component part of their profile and that loess is a lime melkozem /fine earth/ of dust-like mechanical composition possessing a number of characteristic signs. (RZhGeol, 1, 1954)

SO: W-31128, 11 Jan 55

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

USSR/Geology - Desert soils

Card 1/1 : Pub. 86 - 25/35

Authors : Pyaskovskiy, B. V.

Title : Did a desert exist in southern Ukrainia during the Pliocene epoch?

Periodical : Priroda 44/2, 115 - 116, Feb 1955

Abstract : A study is made of the loess soil in the southern part of the Ukraine. In 1914 the scientist, I. Levinskiy, discovered beneath a thick layer of clay rounded-off brick-red rock covered by a black shiny coating, which could be attributed to "desert burn." This is found at Kherson and near Odessa. Against the desert theory are the findings of other scientists attributing the formations described to other causes, thus leaving the question in doubt. Two USSR references (1914 - 1931). Illustration.

Institution : State Scientific Research Institute of Rock Chemical Materials

Submitted : .....

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

A form of contact of loess with parent rock. B. V. Pyaskovskiĭ. *Pochvovedenie* 1956, No. 7, 40-8.—Loess was spotted in the form of tongue-like projections into the parent material of quaternary deposition of alluvial-proluvial formations. The loess, 3 m. deep, is edging off its deposits into the parent material. Several samples of the loess and of its contact with parent material were analyzed mechanically and chemically. Certain similarities in porosity, d., and other phys. properties have been found between the loess and underlying material. The water ext. of these materials and the overlying loess is chemically (SO_4 and Ca) very close. An outstanding characteristic of the loess is its carbonate accumulation, 17.47 against 4.52% in the parent material. It is thus concluded that the evidence is clear: loessification of parent material is a process assocd. with soil formation under conditions of an arid climate. Actually the loess is a formation under the genetic horizon of the soil in the environment of an arid climate which comprises an inseparable part of its profile. Loess represents a carbonate of a silty mech. compn. ...

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

PUTYATA, T.V.; P'YASKOVSKIY, B.V. [P'iaskovs'kyi, B.V.]

Work of a seminar on the history of mathematical sciences. Dop. AN URSR no.5:678 '63. (MIRA 17:9)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

PYASKOVSKIY, B.V. [Piaskovs'kyi, B.V.]

Philosophic views of N.G.Chernyshevskii on the role of mathematics in the cognition of nature. Ist.-mat. zbir. 4:42-55 '63. (MIRA 17:3)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

SHEYKO, A.N.; P'YASKOVSKIY, B.V. [P'iaskovs'kyi, B.V.]

"Dialectics as logic" by P.V.Kopnin. Reviewed by A.N.Sheiko. Dop. AN URSR no.2:273-275 '62. (MIRA 15:2)
(Dialectical materialism)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

P'YASKOVSKIY, B.V. [P"iaskovs'kyi, B.V.]

Is it possible to shorten time? Nauka i zhyttia 11 no. 4:53-54 Ap '61. (MIRA 14:5)

(Space and time)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

SHTOKALO, I.Z.; PYASKOVSKIY, B.V. [Piaskovs'kyi, B.V.]; RAVIKOVICH, S.D. [Ravikovych, S.D.]

"Lenin and modern physics" by V.Hott. Reviewed by I.Z.Shtokalo, B.V.Pi skovs'kyi, S.B.Ravikovych. Dop.AN URSR no.11:1572-1575 '60. (MIRA 13:11)

(Physics--Philosophy) (Lenin, Vladimir Il'ich, 1870-1924) (Hott, V.)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001343720008-3

PYASKOVSKIY, B.V. [Piaskovs'kyi, B.V.]

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